Nishant Mishra

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Education

- **McGill University** — *Montreal, Canada*
  Master of Science(MSc Thesis) - Computer Science; GPA: 4.0/4.0 — *Sep 2019 - present*
  Relevant Courses: *Applied Machine Learning, Computer Vision, Natural Language Processing, Graph Representation Learning, Reinforcement Learning, Probabilistic Graphical Models(MILA)*
  Teaching(Graduate TA): *Applied Machine Learning, Fundamentals of Computer Vision, Artificial Intelligence*

- **Birla Institute of Technology** — *Ranchi, India*
  Bachelor of Engineering(BE) - Electronics and Communication; GPA: 7.92/10 — *Aug 2014 - Jul 2018*
  Relevant Courses: *Engineering Mathematics(Linear Algebra, Calculus), Programming, Data Structures*

Skills Summary

- **Languages and Frameworks**: Python, C++, MATLAB, PyTorch, TensorFlow, Keras, JavaScript, Linux shell scripting
- **Tools and Libraries**: OpenCV, scikit-learn, Pandas, Flask, NLTK, Git, MongoDB, Caffe, Hugging Face, OpenAI-gym
- **Tech and Models**: CNN, LSTM, Transformers, Statistical ML, VAE, GAN, FRCNN, BERT,FaceNet, SimCLR, API

Experience

- **McGill University(AIPHL) | Dr.Peter Savadjiev** — *Montreal, Canada*
  Graduate Research Assistant | Masters Thesis — *May 2020 - present*
  - Applied Deep learning models to solve digital histopathology tasks on Head and Neck Cancer detection microscopy data
  - Prototyped Visual Attention based CNN for patch based segmentation and classification of Tumor region and subsequent downstream tasks to improve automated diagnostics and treatment planning

- **Signzy Technologies** — *Bengaluru, India*
  Software Developer: Machine Learning and Computer Vision — *Jul 2018 - Jul 2019*
  - Developed and deployed machine learning solutions for OCR, Face Recognition, Object Detection, Image forensics, Liveliness Detection, and Image Quality Assessment to help digitization of the bank account opening process which has now been used to open around 20000 accounts nationwide by premiere banks

- **Signzy Technologies** — *Bengaluru, India*
  Machine Learning and Computer Vision Intern — *Jan 2018 - Jun 2018*
  - Developed an in-house ***Optical Character Recognition pipeline(DORY-OCR)*** including automatic cropping, rotation, text detection and recognition for Indian ID cards using CTPN and RNN with CTC loss
  - *Achieved state of the art performance(equivalent to Google OCR) with 0.80 F1 score on the validation data*

- **IRIT, Universite Paul Sabatier | Dr. Christine Senac | Dr. Benjamin Bigot** — *Toulouse, France*
  Summer Research Intern — *May 2017 - Jul 2017*
  - Trained a video OCR system using computer vision & text tracking over consecutive frames for extraction of text from MOOC videos to enrich Speech recognition lexicon & achieved an improvement of 2-20% in the HMM based ASR system

Projects

- **GENERATIVE MULTIMODAL LEARNING**:
  - Hypothesized a multimodal Generative variational inference based model to reconstruct missing modality
  - Trained a multimodal VAE to learn accurate representations for all possible combinations of missing modalities
  - Achieved state of the art reconstruction and classification performance with MNIST speech and image data
- **INCREMENTAL KNOWLEDGE GRAPHS**:
  - Proposed an incremental learning problem for Knowledge Graphs to obtain representations for new entities and also update the representations of old entities using Graph Convolutional Networks
- **GENERIC EXTRACTION MODULE**:
  - Trained a generic biLSTM model using both word(ELMO) and character level embedding(FLAIR) for information retrieval from text OCR outputs
  - Achieved a high recall and precision(>0.8) on ID documents OCR output in a few shot learning(5 samples) setting
- **ANOMALOUS ACTIVITY RECOGNITION**:
  - Developed an efficient real time anomalous activity detection solution for CCTV camera feed for 7 different activities
  - Used multiframe CNN-LSTM combination alongwith spatial flow information achieving an accuracy of 93%
- **IMAGE QUALITY ASSESSMENT**:
  - Developed an ensemble model comprised of highly efficient models for blur, brightness, text readability detection to quantify image quality to filter poor quality images at the client, delivering end-to-end product for
- **OTHER KEY PROJECTS**:
  - Online Learning Of Temporal Knowledge Graphs, Speaker Recognition and Verification system, CropNET:Regression based automatic foreground cropping, Automatic Document Field Highlighter, Reproducibility and Analysis of Deep Policy Gradient methods for Reinforcement Learning, Indian Sign Language Classification,Image stitching for creating panoramas

Publications

- **Conference Paper**: Mishra, Nishant, et al. ***"Performance Evaluation of Neural Networks for Speaker Recognition."*** 2019 IEEE International Conference on Electrical, Computer and Communication Technologies (ICECCT). IEEE, 2019.
- **Thesis**: Nishant Mishra, Prasun Anand, Zainab Feroz **'Integrated system for interconversion of speech and Indian sign language'**, Senior Thesis, BIT Mesra,2018

Top Accomplishments

- Awarded ***Mitacs Research Training Award Fellowship*** – July,2020
- Awarded McGill University Graduate School Funding - September,2019
- Achieved **AIR 45** in ***Nationwide Education and Scholarship Test(NEST)*** - May, 2017